CLAIMS

1. A method for making a plastic film, the method comprising extruding a plastic film (5), mixing before extrusion material which causes bubbles in the plastic film (5) to be stretched into plastic (5a) of the plastic film (5), and orientating the plastic film (5) by stretching after extrusion, **characterized** in that after orientation the plastic film (5) is subjected to pressurized gas so that the gas diffuses in the cavitation bubbles, and thus bubbles (25) containing gas are formed in the plastic film (5).

2. A method according to claim 1, **characterized** in that gas is arranged to act on the plastic film (5) after the first orientation stage and thereafter the plastic film (5) is subjected to a second orientation which is substantially perpendicular to the first orientation so that the bubbles (25) containing gas expand due to the influence of the second orientation and the gas.

3. A method according to claim 2, **characterized** in that at the first orientation stage the plastic film (5) is orientated in the machine direction and at the second orientation stage the plastic film (5) is orientated in the direction substantially transverse to the machine direction.

4. A method according to any one of the preceding claims, **characterized** in that the pressure of the gas acting on the plastic film (5) is over 3 bars.

5. A method according to any one of the preceding claims, **characterized** in that before extrusion an oily substance or a substance having a melting point lower than the orientation temperature of the plastic (5a) is mixed into the plastic (5a).

6. A method according to any one of the preceding claims, **characterized** in that the plastic film (5) is heated at the same time as gas is fed.

7. A method according to claim 6, **characterized** in that the pressure of the pressurized gas is increased so that the temperature of the gas rises, and thus the pressurized gas is used for heating the plastic film (5).

8. A method according to any one of the preceding claims, **characterized** in that pressurized gas is fed by a discharge chamber (15), a sealing chamber (27) is provided at least at one end of the discharge chamber, and gas flowing into the sealing chamber (27) is sucked and

supplied back to the discharge chamber (15).

9. An apparatus for making a plastic film, the apparatus comprising an extruder (1) and at least one orientation device (12, 17) for orientating the extruded film (5), **characterized** in that the apparatus comprises gas supply means (15, 16) arranged after the at least one orientation device (12, 17) for feeding pressurized gas into the plastic film (5) after orientation by stretching so that the fed gas diffuses in the cavitation bubbles that are formed in the plastic film (5) during stretching, and thus bubbles (25) containing gas are formed in the plastic film.

10. An apparatus according to claim 9, **characterized** in that the gas supply means (15, 16) are arranged after the first orientation device (12) and that the apparatus comprises a second orientation device (17) after the first orientation device (12) in the direction of the plastic film (5), the second orientation device (17) being arranged to orientate the plastic film (5) in the direction substantially transverse to the orientation direction of the first orientation device (12) so that the bubbles (25) containing gas expand due to the influence of the second orientation device (17) and the gas.

11. An apparatus according to claim 10, **characterized** in that the first orientation device (12) is arranged to orientate the plastic film (5) in the machine direction and the second orientation device (17) is arranged to orientate the plastic film (5) in the direction substantially transverse to the machine direction.

12. An apparatus according to any one of claims 9 to 11, **characterized** in that the gas supply means comprise a discharge chamber (15), which is provided with means for heating the plastic film (5).

13. An apparatus according to claim 12, **characterized** in that the apparatus comprises means for increasing the pressure of pressurized gas so that the gas temperature rises so high that the gas heats the plastic film (5).

14. An apparatus according to any one of claims 9 to 13, **characterized** in that the gas supply means comprise a discharge chamber (15), and a sealing chamber (27) is provided at least at one end of the discharge chamber (15).

15. An apparatus according to claim 14, **characterized** in that the gas supply means comprise a pump (16) which is arranged to suck

gas from the sealing chamber (27) and means for supplying the gas sucked from the sealing chamber (27) into the discharge chamber (15).

16. An apparatus according to claim 15, **characterized** in that the pump (16) is arranged to such additional air through the sealing chamber (27).

17. A plastic film which comprises bubbles (25) with the maximum diameter of about 100 micrometers and the maximum height of about 10 micrometers, in which case the plastic film has been subjected to stretching and material which has caused cavitation bubbles in the stretched plastic film has been mixed into plastic (5a) of the plastic film (5), **characterized** in that after stretching the plastic film has been subjected to the pressure of pressurized gas so that the bubbles (25) contain said gas and the foaming degree of the plastic film (5) is over 70%.

18. A plastic film according to claim 17, **characterized** in that an oily substance or a substance having a melting point lower than the orientation temperature of the plastic (5a) is mixed into the plastic (5a) to provide the cavitation bubbles that are formed during stretching.

19. A plastic film according to claim 17 or 18, **characterized** in that the plastic film (5) is made of polymethylpentene (TPX).

20. A plastic film according to claim 17 or 18, **characterized** in that the plastic film (5) is made of cyclic olefin copolymer (COC).

21. A plastic film according to claim 17 or 18, **characterized** in that the plastic film (5) is made of a mixture of polymethylpentene (TPX) and cyclic olefin copolymer (COC).

22. A plastic film according to any one of claims 17 to 21, **characterized** in that the plastic film (5) is provided with an electric charge.

23. A plastic film according to any one of claim 17 to 22, **characterized** in that at least one surface of the plastic film (5) is provided with electrically conductive coating.